REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-48 are pending in the present application. Claims 1, 15, 28, 33, 34, and 47 are amended by the present amendment.

In the outstanding Office Action, Claims 1-4, 10, 13, 15-17, 23, 26, 28-31, 33-37, 40, 44, and 46-48 were rejected under 35 U.S.C. § 102(b) as anticipated by Wade et al. ("Development of Algorithms for Automated Elucidation of Spectral Feature/Substructure Relationships in Tandem Mass Spectrometry," Analytica Chimica Acta, 215 (1988) 169-186, herein "Wade"); Claims 1-2, 10, 12-13, 28-31, 33-35, 37, 40, 43-44, and 46-48 were rejected under 35 U.S.C. § 102(b) as anticipated by Kwiatkowski ("A Combined Forward-Reverse Library Search System for Identification of Low-Resolution Mass Spectra," Aalytica Chimica Acta, 112 (1979) 219-231, herein "Kwiatkowski"); and Claims 5-9, 11, 14, 18-22, 24, 25, 27, 32, 38, 39, 41, 42, and 45 were indicated as allowable if rewritten in independent form.

Applicants thank the Examiner for the indication of allowable subject matter. However, in view of the amendment to the independent claims, the allowed claims are maintained in dependent form.

Regarding the rejection of Claims 1-4, 10, 13, 15-17, 23, 26, 28-31, 33-37, 40, 44, and 46-48 under 35 U.S.C. § 102(b) as anticipated by Wade, independent Claims 1, 15, 28, 33, 34, and 47 have been amended to more clearly recite novel features of the invention. The claim amendments find support in the specification, for example, in the paragraph bridging pages 7 and 8 and in Figures 4 and 9-13. No new matter is believed to be added.

Briefly recapitulating, independent Claim 1 is directed to a method for mining mass spectra. The method includes, a) providing an input mechanism for a user to input spectral

characteristics to be identified in a mass spectrum to be mined and for the user to input a relationship between the spectral characteristics, b) receiving from the input mechanism user input spectral characteristics to be used to identify the spectral characteristics in the mass spectrum to be mined, c) receiving from the input mechanism a user input relationship indicative of the relationship between the spectral characteristics, d) searching the mass spectrum to be mined for portions which match the spectral characteristics based on the user input relationship, and e) assigning scores to the portions of the mass spectrum to be mined to indicate a degree of correlation between the portions of the mass spectrum to be mined and the spectral characteristics. Independent Claims 15, 28, 33, 34, and 47 have been amended similar to Claim 1.

In other words, according to the method of Claim 1, (i) spectral characteristics, and (ii) a relationship between the spectral characteristics are entered by a user. Based on these input elements, a search of the mass spectrum to be mined for portions that match the spectral characteristics input in step a) based on the relationship also input in step a) is performed. It is noted that the input spectral characteristics can be found or not in the mass spectrum to be mined.

Turning to the applied art, Wade discloses a method for analyzing patterns in mass spectra based on rules obtained from a training process (see Wade, page 174, first full paragraph). Based on the rules determined prior to the search, unknown structures present in a mass spectrum to be mined are detected (see Wade, paragraph bridging pages 176-177). Wade specifically discloses in the paragraph bridging pages 179 and 180 that "the MAPS software then [i.e., after the training] looks for high correlation between the empirically derived substructure rules and features in the spectra of the unknowns."

In other words, Wade searches only a mass spectrum that includes unknown structures and based on the prior determined rules (stored library) identifies the unknown

structures with known structures that are inherently stored in the rules. Further, the spectral characteristics in Wade are not input by the user but are present in the mass spectrum to be mined.

To the contrary, the method of Claim 1 searches the mass spectrum to be mined for features input by the user and identifies portions of the mass spectrum that correspond to the input spectral characteristics based on the input relationship.

Further, the method of Claim 1 uses both (i) the user input spectral characteristics that may or may not be present in the mass spectrum to be mined, and (ii) the user input relationship between the spectral characteristics to search the mass spectrum to be mined. On the contrary, Wade uses only the "empirically derived substructure rules" and no user input spectral characteristics for finding the unknowns.

Furthermore, it appears that the outstanding Office Action interprets the claimed spectral characteristics and the relationship between the spectral characteristics as corresponding to the spectral characteristics of the unknown element and the empirical rules of Wade. However, this interpretation of the method of Wade is different from the claimed invention because Claim 1 recites that the spectral characteristics are input by the user and searched for in the mass spectrum to be mined while the spectral characteristics of Wade are not input by the user but are present in the mass spectrum to be mined. Thus, the method of Wade is not capable of allowing a user to input the spectral characteristics and/or the relationship between the spectral characteristics.

Accordingly, it is respectfully submitted that independent Claims 1, 15, 28, 33, 34, and 47 and each of the claims depending therefrom patentably distinguish over Wade.

Regarding the rejection of Claims 1-2, 10, 12-13, 28-31, 33-35, 37, 40, 43-44, and 46-48 under 35 U.S.C. § 102(b) as anticipated Kwiatkowski, that rejection is respectfully traversed for the following reasons.

Kwiatkowski, similar to Wade, uses an existent library (rules in Wade) of known mass spectra and compares known features of known elements from the library with unknown features of an unknown component in a mass spectrum to be mined. In other words, the methods of Wade and Kwiatkowski search for unknown elements present in the mass spectrum to be mined by comparing the unknown features of the unknown elements with the known features from the library.

On the contrary, as discussed above, the method of Claim 1 relies on the spectrum characteristics input by the user and on the relationship between the spectrum characteristics also input by the user to identify in the mass spectrum to be mined the existence or not of portions having those spectrum characteristics. Thus, the claimed method does not require a prior library (or prior set of rules) for analyzing the mass spectrum to be mined as the applied references do.

Therefore, Applicants respectfully submit that neither Wade nor Kwiatkowski teaches or suggests the above-noted claimed features. Accordingly, it is respectfully submitted that independent Claims 1, 15, 28, 33, 34, and 47 and each of the claims depending therefrom patentably distinguish over Wade and Kwiatkowski, either alone or in combination.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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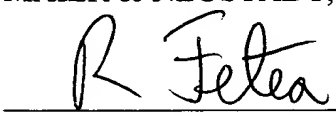

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